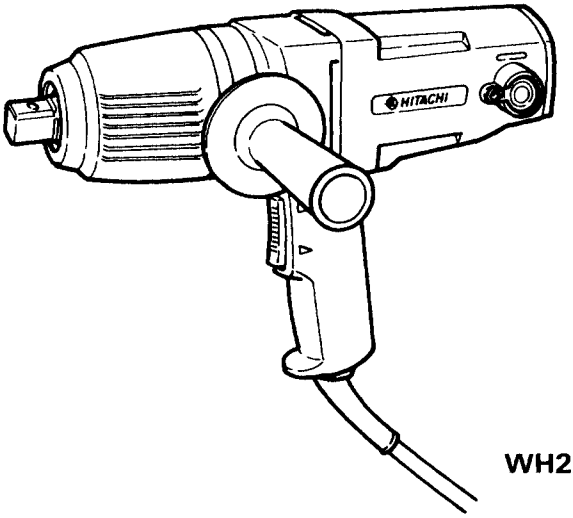
HITACHI

IMPACT WRENCH

MODEL WH 14 · WH 16 · WH 22 · WH 22SA

INSTRUCTION MANUAL



WH22

Note:
Before using this Electric Power Tool, carefully read through this INSTRUCTION MANUAL to ensure efficient, safe operation. It is recommended that this MANUAL be kept readily available as an important reference when using this power tool.

DOUBLE INSULATION

We sincerely thank you for selecting a HITACHI ELECTRIC POWER TOOL. To operate this electric power tool safely and efficiently, please read this INSTRUCTION MANUAL carefully to get a good understanding of the precautions in operation, capacity of the electric power tool, use and the like.

IMPORTANT INFORMATION: SAFETY RULES FOR POWER TOOLS

WARNING: When using electric tools, basic safety precautions should always be followed to reduce the risk of fire, electric shock, and personal injury, including the following.

READ ALL INSTRUCTIONS

1. **KEEP WORK AREA CLEAN.** Cluttered areas and benches invite injuries.
2. **CONSIDER WORK AREA ENVIRONMENT.**
   Don't expose power tools to rain.
   Don't use power tools in damp or wet locations.
   Keep work area well lit.
   Don't use tool in presence of flammable liquids or gases.
   Power tools produce sparks during operation. They also spark when switching ON/OFF. Never use power tools in dangerous sites containing lacquer, paint, benzine, thinner, gasoline, gases, adhesive agents, and other materials which are combustible or explosive.
3. **GUARD AGAINST ELECTRIC SHOCK.** Prevent body contact with grounded surfaces. For example; pipes, radiators, ranges, refrigerator enclosures.
4. **KEEP CHILDREN AWAY.** Do not let visitors contact tool or extension cord. All visitors should be kept away from work area.
5. **STORE IDLE TOOLS.** When not in use, tools should be stored in dry, and high or locked-up place - out of reach of children.
6. **DON'T FORCE TOOL.** It will do the job better and safer at the rate for which it was intended.
7. **USE RIGHT TOOL.** Don't force small tool or attachment to do the job of a heavy-duty tool.
   Don't use tool for purpose not intended – for example – don't use circular saw for cutting tree limbs or logs.
8. **DRESS PROPERLY.** Do not wear loose clothing or jewelry. They can be caught in moving parts.
   Rubber gloves and non-skid footwear are recommended when working outdoors.
   Wear protective hair covering to contain long hair.
9. **USE SAFETY GLASSES.** Also use face or dust mask if cutting operation is dusty.
   All persons in the area where power tools are being operated should also wear safety eye protectors and face or dust masks.
10. **DON'T ABUSE CORD.** Never carry tool by cord or yank it to disconnect from receptacle. Keep cord from heat, oil, and sharp edges.

11. **SECURE WORK.** Use clamps or a vise to hold work. It's safer than using your hand and it frees both hands to operate tool.
12. **DON'T OVERREACH.** Keep proper footing and balance at all times.
13. **MAINTAIN TOOLS WITH CARE.** Keep tools sharp and clean for better and safer performance.
    Follow instructions for lubricating and changing accessories.
    Inspect tool cords periodically and if damaged, have repaired by authorized service facility.
    Inspect extension cords periodically and replace if damaged.
    Keep handles dry, clean, and free from oil and grease.
14. **DISCONNECT TOOLS.** When not in use, before servicing, and when changing accessories, such as blades, bits, cutters.
15. **REMOVE ADJUSTING KEYS AND WRENCHES.** Form habit of checking to see that keys and adjusting wrenches are removed from tool before turning it on.
16. **AVOID UNINTENTIONAL STARTING.** Don't carry plugged-in tool with finger on switch. Be sure switch is off when plugging in.
17. **OUTDOOR USE EXTENSION CORDS.** When tool is used outdoors, use only extension cords intended for use outdoors and so marked.
18. **STAY ALERT.** Watch what you are doing. Use common sense. Do not operate tool when you are tired.
19. **CHECK DAMAGED PARTS.** Before further use of the tool, a guard or other part that is damaged should be carefully checked to determine that it will operate properly and perform its intended function. Check for alignment of moving parts, binding of moving parts, breakage of parts, mounting, and any other conditions that may affect its operation. A guard or other part that is damaged should be properly repaired or replaced by an authorized service center unless otherwise indicated elsewhere in this instruction manual.
    Have defective switches replaced by authorized service center.
    Do not use tool if switch does not turn it on and off.
20. **AVOID USING A POWER TOOL FOR APPLICATIONS OTHER THAN THOSE SPECIFIED.** Never use a power tool for applications other than those specified in the instruction manual.
21. **ENSURE SAFE OPERATION THROUGH CORRECT HANDLING.** Secure safe operation through correct handling by observing the instructions described herein.
    Do not employ accessories other than those specified herein; otherwise, a hazardous condition may be created.
    Never allow a power tool to be used by persons not familiar with correct handling (such as children) or by those who cannot handle the tool correctly.
22. **CONFIRM THAT NO ITEMS SUCH AS AN ELECTRIC CABLE OR CONDUIT ARE BURIED INSIDE.** In places where live wiring may be hidden behind a wall, floor, ceiling, etc. do not hold or contact any metal parts of the tool. In such cases, metal parts could become electrically live and present a serious shock hazard.

23. **KEEP THE RIGHT PARTS IN THE RIGHT POSITIONS.** Do not remove covers and screws which have been factory-mounted. They perform important respective roles. Keep them in the right positions.
24. **SHOULD THE PLASTIC HOUSING OR HANDLE OF A POWER TOOL BE CRACKED OR DEFORMED, DO NOT USE IT.** Since cracked or deformed parts may lead to an operator receiving an electric shock, do not use such a power tool. Immediately have it repaired.
25. **SECURELY MOUNT ACCESSORIES AND BLADES TO THE TOOL MAIN BODY.** Extra care must be taken when using tools on elevated location (such as a roof ladder, scaffold, or the like) to prevent injury to someone on a lower level in the event the tool and/or accessory should drop.
26. **ALWAYS KEEP THE MOTOR AIR VENT FULLY OPENED.** A constantly open motor air vent is necessary to allow air to come in and out for cooling the motor. Do not allow it to become clogged up, even if dust is blown through it.
27. **OPERATE POWER TOOLS AT THE RATED VOLTAGE.** Operate power tools at voltages specified on their nameplates.
28. **NEVER TOUCH THE MOVING PARTS.** Never touch the moving parts such as blades, bits, cutters and others.
29. **STOP OPERATION IMMEDIATELY IF ANY ABNORMALITY IS DETECTED.** Should a power tool be detected as out of order or should other abnormalities be observed during operation, stop using the tool immediately.
30. **NEVER LEAVE TOOL RUNNING UNATTENDED. TURN POWER OFF.** Don't leave tool until it comes to a complete stop.
31. **CAREFULLY HANDLE POWER TOOLS.** Should a power tool be dropped or struck against hard materials inadvertently, it may be deformed, cracked, or damaged.
32. **DO NOT WIPE PLASTIC PARTS WITH SOLVENT.** Solvents such as gasoline, thinner, benzine, carbon tetrachloride, and alcohol may damage and crack plastic parts. Do not wipe them with such solvents. Wipe plastic parts with a soft cloth lightly dampened with soapy water.
33. **WHEN REPLACING A COMPONENT PART, ADOPT THE SAME TYPE.** When replacing a component part with a new one, adopt the same type of new part. Also, never attempt to repair a power tool yourself.
34. **SAVE THESE INSTRUCTIONS**

SERVICE AND REPAIRS

All quality tools will eventually require servicing or replacement of parts due to wear from normal use. These operations should ONLY be performed by an AUTHORIZED HITACHI POWER TOOL REPAIR SHOP.

REPLACEMENT PARTS

When servicing use only identical replacement parts.

DOUBLE INSULATION SYSTEM ENHANCES SAFE OPERATION

To enhance safe operation of this electric power tool, HITACHI has adopted a double insulation system. The term "double insulation" used here denotes an insulation system with two insulations physically separated and arranged between the electrically conductive material connected to the power supply and the outer frame subject to contact by the operator.

Thus, the power tool is termed double insulated and both the " ⧈ " mark and "Double insulation", or either one is indicated on the nameplate.

DOUBLE INSULATION

While no external grounding is required with this system, normal safety precautions as outlined in this manual must still be followed.

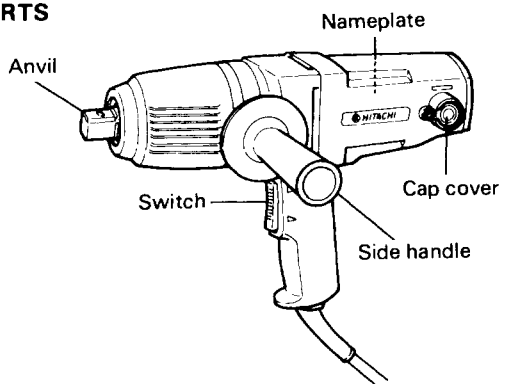
To maintain the effectiveness of the double insulation system, follow the precautions described below:

1. Always contact your dealer or an authorized HITACHI service agent when assembling, disassembling or replacing parts other than accessories or carbon brushes. Improper assembly and/or replacement with wrong parts may result in eliminating the double insulation-feature.
2. Clean the exterior of the tool with a soft cloth moistened with soapy water, and dry thoroughly. Chloric solvent, gasoline, and thinner will cause plastic components to dissolve.

PRECAUTIONS ON USING IMPACT WRENCH

1. When working in high places, check there is nobody below. During operation, take care not to catch or tighten the cord accidentally.
2. Use the earplugs if using for a long time use.
3. Switch the reversing switch only after the motor is stopped when it is necessary to change the direction of the rotation.
4. Use a step up transformer when a long extension cable is used.
5. Confirm the tightening torque by a torque wrench before use in order to ascertain the correct tightening torque to be used.
6. Attach the hex. socket securely onto the anvil. If the hex. socket is insufficiently secured, it may drop out and cause an accident. For hex. socket attachment refer to "PRIOR TO OPERATION" on page 6.
7. Confirm whether the socket has any crack in it.

NAME OF PARTS



(WH22)

SPECIFICATIONS

Model	WH14	WH16	WH22, WH22SA
Motor	Single-Phase, Series-Wound Commutator Motor		
Power Source	Single-Phase 115V AC 60 Hz		
Current	4A	5A	10A
No-load Speed	2100 rpm	1700 rpm	1600 rpm
Capacities	3/8" – 5/8"	3/8" – 5/8"	5/8" – 7/8"
Tightening Torque	20 kg-m (147 ft-lbs) tightening M16 x 55 (F10T) (high strength bolt)	30 kg-m (220 ft-lbs) tightening M16 x 55 (F10T) (high strength bolt)	60 kg-m (440 ft-lbs) tightening M22 x 70 (F10T) (high strength bolt)
Square Drive	1/2"	1/2"	3/4"
Weight	5.1 lbs	6.4 lbs	11 lbs

ACCESSORIES

CAUTION:

Recommended accessories for this Electric Power Tool are mentioned in this manual.
The use of any other attachment or accessory might be hazardous.

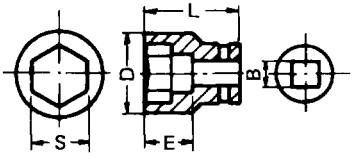
STANDARD ACCESSORIES

- ○ WH14: Hexagonal bar wrench (Code No. 001827) 1
- ○ WH16: Hexagonal bar wrench (Code No. 944458) 1
- ○ WH22, WH22SA:
  - (1) Side handle (Code No. 985280) 1
  - (2) Hex. socket 32 mm (including pin and ring) (Code No. 874523) 1
  - (3) Steel case (Code No. 985293) 1
  - (4) Hexagonal bar wrench (Code No. 944458) 1

OPTIONAL ACCESSORIES (sold separately)

1. Variety of sockets

Although the HITACHI Impact Wrench is delivered with only one standard socket, ample sockets are available to cover impact tightening of various sizes and types of bolts.



(1) WH14, WH16:

Table 1 B = 1/2"

Socket Designation	Ordinary Socket					Long Socket				
	Dimension (mm)				Code No.	Dimension (mm)				Code No.
	S	D	E	L		S	D	E	L	
Hex. Socket 12						12	20	34	52	955138
13						13	21.5	34	52	955139
14	14	25	24	40	873540	14	22	34	52	955140
17	17	28	15	32	873536	17	25	34	52	955141
19	19	28	17	34	873624	19	28	34	52	955142
21	21	32	19	36	873626	21	31	34	52	955143
22	22	35	24	40	873627	22	32.5	34	52	955144
23	23	36	25	40	873628	23	33	34	52	955145
24	24	38	25	40	873629	24	34	34	52	955146
26	26	38	25	40	873630	26	38	57	75	955147
27	27	42	24	40	985195	27	40	57	75	955148
30	30	42	34	50	985196	30	42	57	75	985197

(2) WH22, WH22SA:

Table 2 B = 3/4"

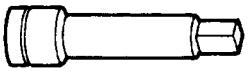
Socket Designation	Ordinary Socket					Long Socket				
	Dimension (mm)				Code No.	Dimension (mm)				Code No.
	S	D	E	L		S	D	E	L	
Hex. Socket 22	22	32	32	60	955031					
23	23	38	29	55	874527	23	33	32	60	955032
24	24	40	29	55	874528	24	34	32	60	955033
26	26	42	29	55	874529	26	38	57	85	955034
27	27	43	29	55	874530	27	39	57	85	955035
29	29	45	29	55	874531	29	42	57	85	955036
30	30	47	29	55	874532	30	43	57	85	955037
32	32	50	29	55	874523	32	46	72	100	955038
35	35	52	29	55	874533	35	52	72	100	955039
36	36	55	29	55	874534	36	55	72	100	955040

2. **Extension bar: Code No. 873633 (for WH14, WH16)**
   Code No. 874535 (for WH22, WH22SA)

   The extension bar is convenient for working in very restricted spaces or when the socket provided cannot reach the bolt to be tightened.

   CAUTION

   When the extension bar is used the tightening torque is reduced slightly compared with the ordinary socket. So it is necessary to operate the tool a little longer to get the same torque.

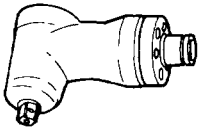


3. **Universal joint: Code No. 955135 (for WH14)**
   Code No. 955088 (for WH22, WH22SA)

   The universal joint is convenient for impacting nuts when there is an angle between the socket and wrench, or when working in a very narrow space.

4. **Corner attachment [Type EW-14R] (for only WH14, WH16)**

   Use this attachment only when the machine is applied to the nut or bolt at a right angle.



APPLICATIONS

○ Tightening and loosening various kinds of bolts and nuts

PRIOR TO OPERATION

1. **Power source**

   Ensure that the power source to be utilized conforms to the power requirements specified on the product nameplate.

2. **Power switch**
   Ensure that the power switch is in the OFF position. If the plug is connected to a power receptacle while the power switch is in the ON position, the power tool will start operating immediately, inviting serious accident.
3. **Extension cord**
   When the work area is removed from the power source, use an extension cord of sufficient thickness and rated capacity. The extension cord should be kept as short as practicable.
4. **Confirming condition of the environment**
   Confirm that the work site is placed under appropriate conditions conforming to prescribed precautions.
5. **Confirming the power receptacle**
   If the power receptacle only loosely accepts the plug, the receptacle must be repaired. Contact the nearest electric store for repair service.
6. **Attaching the side handle**
   The position of the side handle can be changed by unscrewing the handle. (Right hand screw) Turn the handle to the desired position for the job and secure the handle by screwing up tight.
7. **Mounting the socket**

(1) Pin, O-ring type (WH22) (Fig. 1)
Select a socket matched to the bolt to be tightened or loosened. Insert the socket on the anvil of the wrench, and secure it with the pin and ring. When removing the socket, reverse the sequence.

(2) Plunger type (WH14, WH16) (Fig. 2)
Align the plunger located in the square part of the anvil with the hole in the hex. socket and mount the hex. socket on the anvil. Check that the plunger is fully engaged in the hole.

(3) Plunger type (WH22SA) (Fig. 3)
Align the plunger located in the square part of the anvil with the hole in the hex. socket. Then push the plunger, and mount the hex. socket on the anvil. Check that the plunger is fully engaged in the hole. When removing the socket, reverse the sequence.

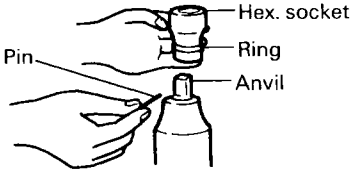


Fig. 1

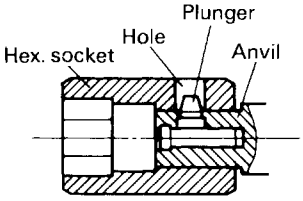


Fig. 2

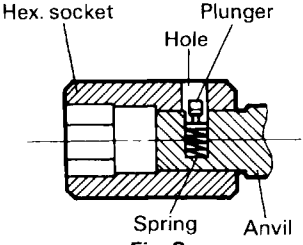


Fig. 3

HOW TO USE

1. **Operation of switch (Fig. 4)**
   The switch in this machine functions as a motor switch and rotational direction selector switch. When the switch is set to R indicated in the handle cover, the motor rotates clockwise to tighten the bolt. When the switch is set to L, the motor rotates counterclockwise to loosen the bolt. When the switch is released, the motor stops.
   CAUTION
   Be sure to turn the switch OFF and wait until the motor completely stops before changing the direction of wrench revolution. Switching while the motor is rotating will result in burning the motor.
2. **Tightening and loosening bolts**
   A hex. socket matching the bolt or nut must first be selected. Then mount the socket on the anvil, and grip the nut to be tightened with the hex. socket. Holding the wrench in line with the bolt, press the power switch to impact the nut for several seconds.
   If the nut is only loosely fitted to the bolt, the bolt may turn with the nut, therefore preventing proper tightening. In this case, stop impact on the nut and hold the bolt head with a wrench before restarting impact, or manually tighten the bolt and nut to prevent them slipping.

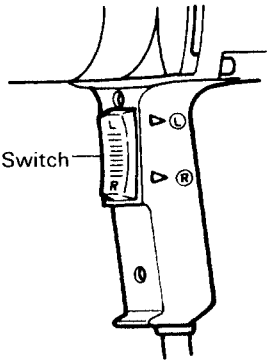


Fig. 4

OPERATIONAL CAUTIONS

1. **Confirm the line voltage (Figs. 5, 6, 7, 8 and 9)**
   The available tightening torque is influenced by line voltage. Reduced line voltage lowers the available tightening torque.
   For example, if you use a 115 V type wrench on a 105 V line the available tightening torque will be reduced to 70 to 90%. When extending the power cord, use an extension cord which is as short as possible. When the line voltage is low and a long extension cord is needed a step up transformer should be used. The relation between the line voltage and the tightening torque are shown in the figures.
2. **Work at a tightening torque suitable for the bolt under impact**
   The optimum tightening torque for nuts and bolts differs with material and size of the nuts and bolts. An excessively large tightening torque for a small bolt may stretch or break the bolt. The tightening torque increases proportionally to the operating time. Use the correct operating time for the bolt.

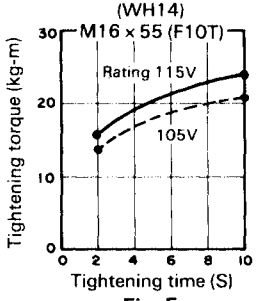


Fig. 5

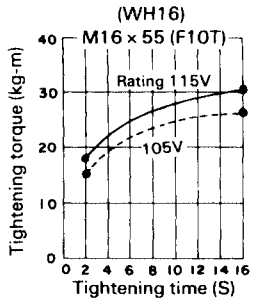


Fig. 6

3. **Selecting the socket to be matched to the bolt**

Be sure to use a socket which is matched to the bolt to be tightened. Using an improper socket will result not only in insufficient tightening but also in damage to the socket or nut.

A worn or deformed hex. or square-holed socket will not give an adequate tightness for fitting to the nut or anvil, consequently resulting in loss of tightening torque.

Pay attention to wear of socket holes, and replace before further wear has developed. Matching socket and bolt sizes are shown in Tables 1 and 2.

The numerical value of a socket designation denotes the side-to-side distance (S) of its hex. hole.

4. **Holding the tool**

Hold the Impact Wrench firmly with both hands by the body handle and the side handle. In this case hold the wrench in line with the bolt.

It is not necessary to push the wrench very hard. Hold the wrench with a force just sufficient to counteract the impact force.

5. **Confirm the tightening torque**

The following factors contribute to a reduction of the tightening torque. So confirm the actual tightening torque needed by screwing up some bolts before the job with a hand torque wrench.

Factors affecting the tightening torque

(1) Line voltage:

The tightening torque decreases when the line voltage becomes low. (See Figs. 5, 6, 7, 8 and 9)

(WH22, WH22SA)

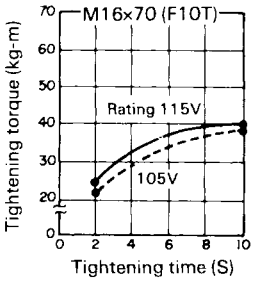


Fig. 7

(WH22, WH22SA)

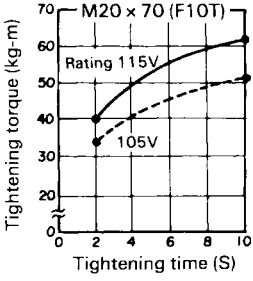


Fig. 8

(WH22, WH22SA)

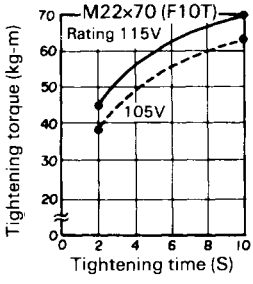


Fig. 9

(2) Operating time:

The tightening torque increases when the operating time increases. But the tightening torque does not increase above a certain value even if the tool is driven for a long time. (See Figs. 5, 6, 7, 8 and 9)

(3) Diameter of bolt:

The tightening torque differs with the diameter of the bolt as shown Figs. 5, 6, 7, 8 and 9. Generally a larger diameter bolt has a larger tightening torque.

(4) Tightening conditions:

The tightening torque differs according to the torque ratio; class, and length of bolts even when bolts with the same size threads are used. The tightening torque also differs according to the condition of the surface of metal through which the bolts are to be tightened.

(5) Using optional parts:

The tightening torque is reduced a little when an extension bar, universal joint or a long socket is used.

(6) Clearance of the socket:
A worn or deformed hex. or a square-holed socket will not give an adequate tightness to the fitting between the nut or anvil, consequently resulting in loss of tightening torque. Using an improper socket which does not match to the bolt will result in an insufficient tightening torque. Matching socket and bolt sizes are shown in Tables 1 and 2.

MAINTENANCE AND INSPECTION

CAUTION:

Be sure to disconnect the plug during maintenance and inspection.

1. **Inspecting the socket**
   A worn or deformed hex. or a square-holed socket will not give an adequate tightness to the fitting between the nut or anvil, consequently resulting in loss of tightening torque. Pay attention to wear of a socket holes periodically, and replace with a new one if needed.
2. **Inspecting the mounting screws**
   Regularly inspect all mounting screws and ensure that they are properly tightened. Should any of the screws be loose, retighten them immediately. Failure to do so could result in serious hazard.
3. **Inspecting the carbon brushes (Fig. 10)**
   The motor employs carbon brushes which are consumable parts. Since an excessively worn carbon brush could result in motor trouble, replace the carbon brush with a new one which has the same carbon brush No. shown in the figure when it becomes worn to or near the "wear limit". In addition, always keep carbon brushes clean and ensure that they slide freely within the brush holders.

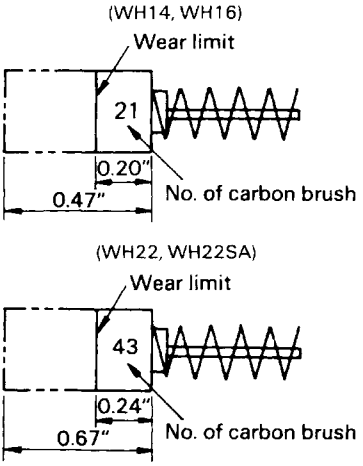


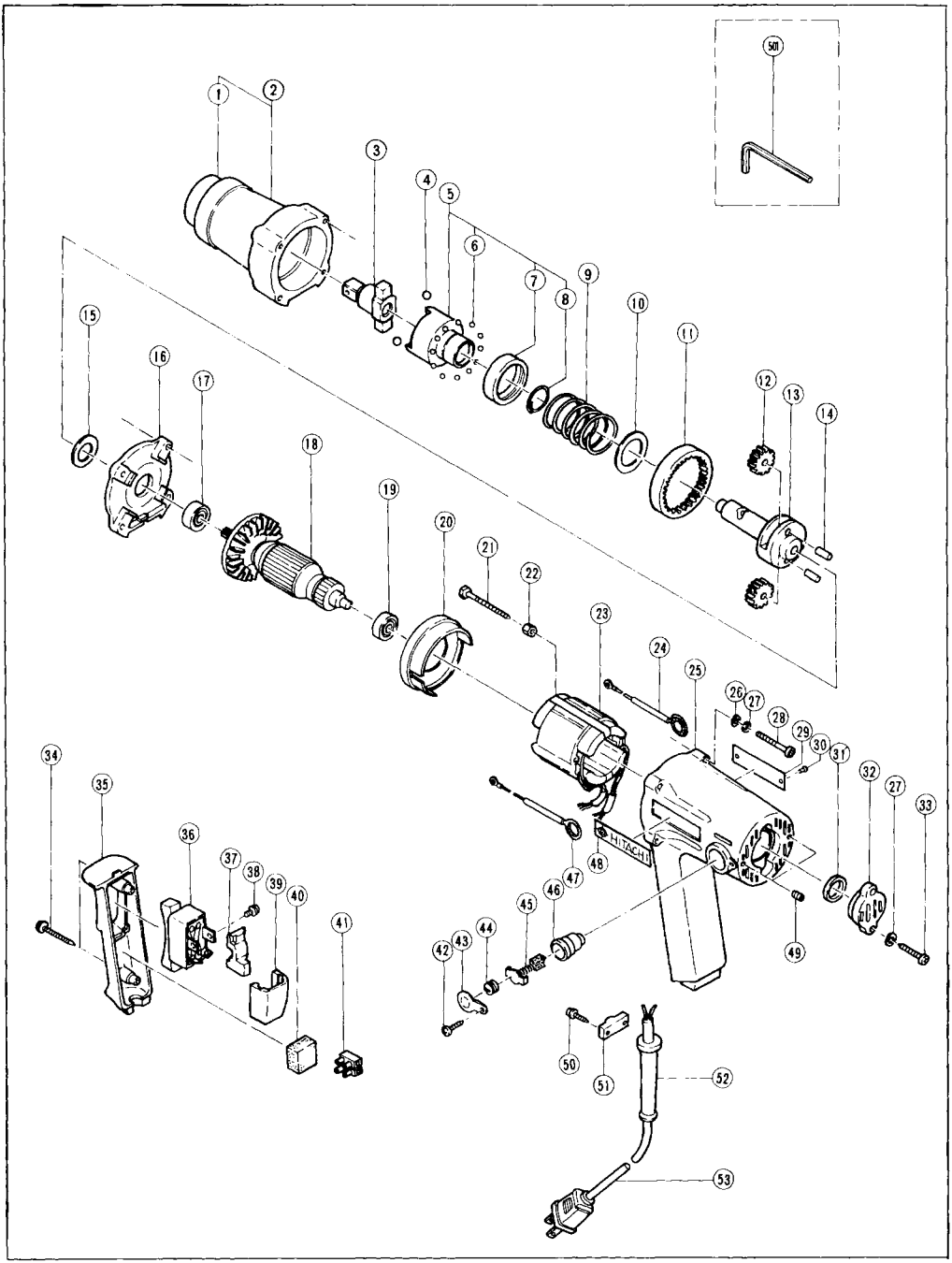
Fig. 10

4. **Replacing a carbon brush**
   To replace a carbon brush, use a minushead screwdriver to disassemble the brush cap after disassembling the cap cover.
   Then remove the carbon brush together with the spring.
   When assembling, reverse the procedure for disassembling. In this case assemble the cap cover after screwing up the brush cap firmly.

NOTE

Due to HITACHI's continuing program of research and development, the specifications herein are subject to change without prior notice.

WH14

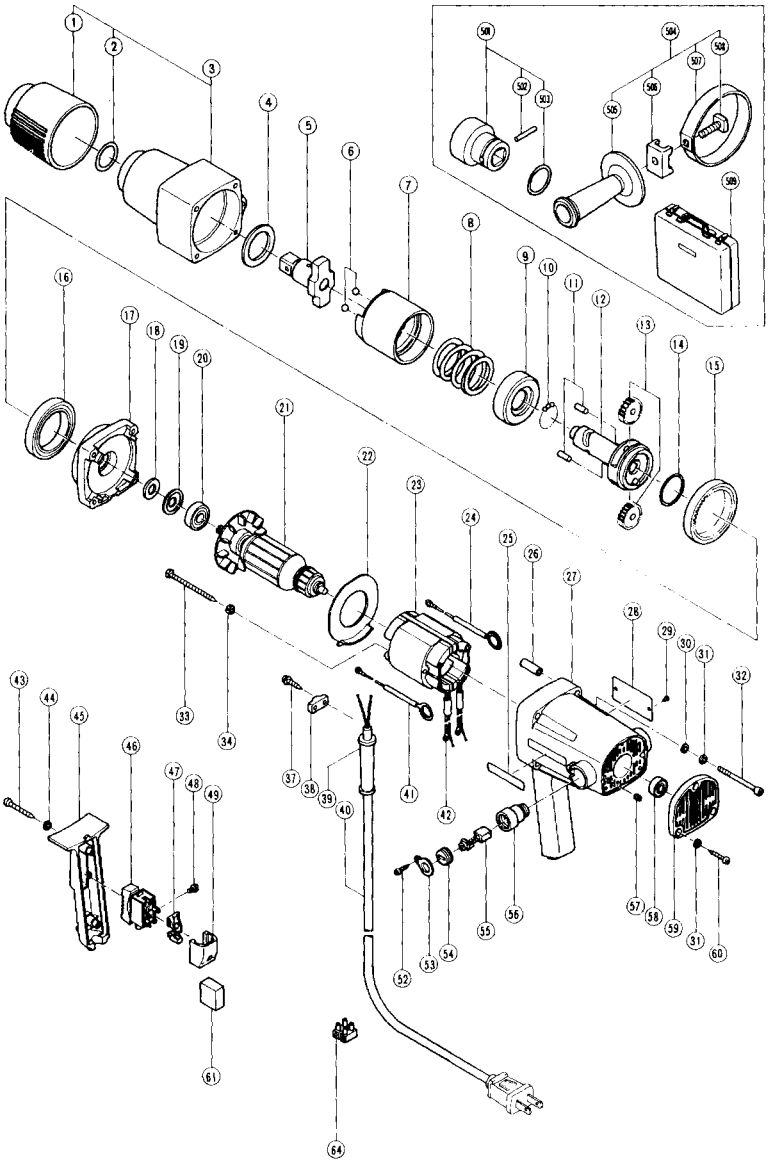


WH14

Item No.	Parts Name	
1	Bumper	
2	Hammer Case Ass'y	
3	Anvil (A)	
4	Steel Ball	D6.35
5	Hammer Ass'y	
6	Steel Ball	D3.17
7	Spring Sheet	
8	Retaining Ring	
9	Spring	
10	Washer	
11	Ring Gear	
12	Idle Gear	
13	Spindle	
14	Needle Roller	
15	Washer (B)	
16	Inner Cover Ass'y	
17	Ball Bearing (608DDC2)	
18	Armature Ass'y	
19	Ball Bearing (608ZZC2)	
20	Fan Guide	
21	Hexagon Hd. Tapping Screw	M4 x 45
22	Special Washer	
23	Stator Ass'y	
24	Internal Wire Ass'y	
25	Housing Ass'y	
26	Bolt Washer	
27	Spring Lock Washer	
28	Hexagon Socket Hd. Bolt	M4 x 45
29	Name Plate	
30	Rivet	
31	Rubber Washer	
32	Tail Cover	
33	⊕ Hd. Tapping Screw	M4 x 16
34	⊕ Hd. Tapping Screw	M4 x 35
35	Handle Cover	
36	Switch (Screw Type)	
37	Switch Adapter	
38	⊕ Hd. Machine Screw	M3.5 x 5
39	Switch Holder	
40	Support	
41	Pillar Terminal (B)	

Item No.	Parts Name	
42	⊕ Hd. Tapping Screw	M4 x 10
43	Cap Cover	
44	Brush Cap	
45	Carbon Brush	
46	Brush Holder	
47	Internal Wire Ass'y	
48	HITACHI Label	
49	Hexagon Socket Hd. Set Screw	M4 x 5
50	⊕ Hd. Tapping Screw	M4 x 16
51	Cord Clip	
52	Cord Armor	
53	Cord	
501	Hexagon Bar Wrench	3mm

Parts are subject to possible modification without notice due to improvements.



The drawing on this page and the list on the next page are parts structural drawing and parts list of model WH22.
For model WH16, WH22SA refer to the drawing and the list.

WH22

Item No.	Parts Name	
1	Bumper	
2	O-Ring (P28)	
3	Hammer Case Ass'y	
4	Washer (A)	
5	Anvil (A)	
6	Steel Ball	D7.14
7	Hammer	
8	Spring	
9	Spring Seat	
10	Steel Ball	D3.969
11	Gear Shaft	
12	Spindle	
13	Idle Gear	
14	Clip (A)	
15	Ring Gear	
16	Ball Bearing (6910C2)	
17	Inner Cover	
18	Felt Packing	
19	Packing Washer	
20	Ball Bearing (6200VVCM)	
21	Armature Ass'y	
22	Fan Guide	
23	Stator Ass'y	
24	Internal Wire Ass'y	
25	HITACHI Label	
26	Collar	
27	Housing Ass'y	
28	Name Plate	
29	Rivet	
30	Washer	
31	Spring Lock Washer	
32	Hexagon Socket Hd.Bolt	M5 x 60
33	Hexagon Hd. Tapping Screw	M5 x 70
34	Special Washer	
37	⊕ Hd. Tapping Screw	M4 x 16
38	Cord Clip	
39	Cord Armor	
40	Cord	
41	Internal Wire Ass'y	
42	Terminal (A)	
43	⊕ Hd. Tapping Screw	M4 x 35

Item No.	Parts Name	
44	Washer	
45	Handle Cover	
46	Switch	
47	Switch Adapter	
48	⊕ Hd. Machine Screw	M3.5 x 5
49	Switch Holder	
52	⊕ Hd. Tapping Screw	M4 x 10
53	Cap Cover	
54	Brush Cap	
55	Carbon Brush	
56	Brush Holder	
57	Hexagon Socket Hd. Set Screw	M5 x 6
58	Ball Bearing (608ZZC2)	
59	Tail Cover	
60	⊕ Hd. Tapping Screw	M5 x 25
61	Support	
64	Pillar Terminal (A)	
501	Hexagon Socket 32mm (55L)	
502	Socket Pin	
503	Socket Ring	
504	Side Handle Ass'y	
505	Side Handle	
506	Handle Base	
507	Ring	
508	Square Bolt	M8
509	Case Ass'y	

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